

Appln No. 10/602,298

Amdt date March 9, 2005

Reply to Office action of December 20, 2004

REMARKS/ARGUMENTS

Claims 1-23 are pending in the present application, of which claims 1, 12 and 23 are independent. Claims 1, 3-5, 7, 10, 12, 16, 18, 21 and 23 have been amended herein. Applicants request reconsideration and allowance of claims 1-23.

I. Rejection of Claims 3-5 and 10 under 35 U.S.C. §112, Second Paragraph

Claims 3-5 and 10 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. As applicants have amended claims 3-5 and 10 to overcome the rejection, applicants request that the rejection of claims 3-5 and 10 be withdrawn.

II. Rejection of Claims 1, 7-8 and 12-22 under 35 U.S.C. §102(b)

Claims 1, 7-8 and 12-22 have been rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 6,172,382 ("Nagahama et al."). In rejecting claim 1, the Examiner contends "Nagahama discloses in Figure 2 a semiconductor chip comprising a ridge structure at a junction surface of the laser chip; and a plurality of pads 24 only on non-active areas of the junction surface, wherein the pads protrude beyond an edge of the ridge structure."

In an exemplary embodiment of the present invention, as can be seen in FIGs. 4A and 4B of the present application, "because the protective pads 406 protrude beyond the ridge structure 404, the pick-and-place tool 106 contacts the protective pads 406

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instead of the ridge structure 404." (page 4, line 22 to page 5, line 2). For example, claim 1 recites, in a relevant portion, "the plurality of pads protrude beyond an edge of the ridge structure."

Applicants do not find any disclosure of a corresponding or similar structure in Nagahama et al. Only ridge that applicants see in FIG. 2 of Nagahama et al. is described on col. 18, lines 60-62 as "[f]ormed on the p-side contact layer 20 and the p-side cladding layer 19 is a ridge which extends long in the direction of resonance" (Emphasis Added) It is applicants' understanding that, in FIG. 2 of Nagahama et al., n pad electrodes 24 are disposed on the n electrodes 23 and the insulating film 25 at a level far below that of the ridge, and do not protrude beyond an edge of the ridge structure. If the rejection of claim 1 is to be maintained, applicants respectfully request that the Examiner provide a more clear guidance, as a minimum, as to which element of Nagahama et al. corresponds to a junction surface, and in what sense the n pad electrodes 24 protrude beyond an edge of the ridge structure.

While applicants believe claim 1 is patentably distinguishable over Nagahama et al., applicants have amended claim 1 for further clarification to expedite patent issuance. Claim 1 now recites, in a relevant portion, "a ridge structure disposed between channels formed on a junction surface of the laser chip." Since Nagahama et al. does not disclose such a ridge structure or that "the plurality of pads protrude beyond an edge of the ridge structure," applicants submit that claim 1 is patentably distinguishable over Nagahama et al. Therefore,

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applicants request that the rejection of claim 1 over Nagahama et al. be withdrawn.

Since claims 7 and 8 depend from claim 1, they incorporate all the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore, applicants request that the rejection of claims 7-8 over Nagahama et al. be withdrawn.

Claim 12 recites, in a relevant portion, "A method . . . comprising . . . providing a ridge structure at a junction surface of the laser chip between channels formed on the junction surface . . . the plurality of pads protrude beyond an edge of the ridge structure." For reasons similar to those given in reference to claim 1, Nagahama et al. does not disclose such a method. Therefore, applicants submit that Nagahama et al. does not anticipate claim 12, and request that the rejection of claim 12 over Nagahama et al. be withdrawn.

Since claims 13-22 depend, directly or indirectly, from claim 12, they incorporate all the terms and limitations of claim 12 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore, applicants request that the rejection of claims 13-22 over Nagahama et al. be withdrawn.

III. Rejection of Claims 1-2, 6, 9 and 12-22 under 35 U.S.C.

§102(e)

Claims 1-2, 6, 9 and 12-22 have been rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent Application Publication No. 2004/0026779 ("Cai et al."). The

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Examiner contends "[w]ith respect to claim 1, Cai discloses in Figure 3 a semiconductor chip 300 comprising a ridge structure 305 at a junction surface the laser chip; and a plurality of pads 302 only on non-active areas of the junction surface, wherein the pads protrude beyond an edge of the ridge structure and an edge of the junction surface."

Cai et al. on FIG. 3 shows a ridge waveguide 305, and bonding pads 302 that are formed on both sides of the ridge waveguide 305. However, applicants do not see in FIG. 3 or in any drawings or portions of the specification of Cai et al. any disclosure of "a ridge structure disposed between channels formed on a junction surface of the laser chip." (Emphasis Added). Therefore, applicants submit that claim 1 is not anticipated by Cai et al., and request that the rejection of claim 1 be withdrawn.

Since claims 2, 6 and 9 depend, directly or indirectly, from claim 1, they incorporate all the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore, applicants request that the rejection of claims 2, 6 and 9 over Cai et al. be withdrawn.

Claim 12 recites, in a relevant portion, "A method . . . comprising . . . providing a ridge structure at a junction surface of the laser chip between channels formed on the junction surface." For reasons similar to those given in reference to claim 1, Cai et al. does not disclose such a method. Therefore, applicants submit that Cai et al. does not

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anticipate claim 12, and request that the rejection of claim 12 over Cai et al. be withdrawn.

Since claims 13-22 depend, directly or indirectly, from claim 12, they incorporate all the terms and limitations of claim 12 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore, applicants request that the rejection of claims 13-22 over Cai et al. be withdrawn.

Since there are no other rejections for claims 1-2, 6-9 and 12-22 other than the ones addressed (and overcome) above, applicants request that claims 1-2, 6-9 and 12-22 be allowed.

IV. Rejection of Claims 3-5, 10-11 and 23 under 35 U.S.C.

§103(a)

Claims 3-5, 10-11 and 23 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent Application Publication No. 2004/0155254 ("Cai II") in view of U.S. Patent No. 6,574,379 ("Miyazaki").

Since claims 3-5 and 10-11 depend, directly or indirectly, from claim 1, they incorporate all the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish them over the cited references. Therefore, applicants request that the rejection of claims 3-5 and 10-11 be withdrawn and that they be allowed.

Regarding claim 23, the Examiner contends "Cai and Miyazaki disclose the claimed invention as shown in the rejection of claims 3-4 and further including a substrate 306." Regarding Cai II, the Examiner contends "Cai discloses the claimed

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invention except for a manufacturing tool "can" abut the pad without abutting the ridge shape structure." Regarding Miyazaki, the Examiner contends, "Miyazaki discloses in Figures 1-2 and 7-10 an optical chip that comprising ridge shape structure having a plurality of pads 18 only on non-active areas of the junction surface."

However, neither Cai II nor Miyazaki discloses "a ridge structure disposed between channels formed on the junction surface, wherein the ridge structure protrudes beyond an edge of the junction surface." Also, it is clear in Cai II (e.g., FIG. 3) that bonding pads 304 do not protrude beyond an edge of the ridge waveguide 302. Further, Miyazaki does not disclose a semiconductor ridge waveguide laser, but an optical modulator, and applicants do not see at least one limitation of claim 23, namely, "the plurality of pads reside only on non-active areas of the junction surface," disclosed by Miyazaki because applicants do not understand what would be meant by the terms "non-active areas" and "junction surface" in reference to the optical modulator of Miyazaki. If the rejection of claims 3-4 and/or 23 is to be maintained, applicants request that the Examiner be more specific as to which elements of the optical modulator of Miyazaki correspond to "non-active areas" and "junction surface", and in what sense "the plurality of pads reside only on non-active areas of the junction surface."

The Examiner also contends that "[f]or the improvement, it would have been obvious to the one having ordinary skill in the art at the time the invention was made to provide a laser chip that has a plurality of pads on the non-active area that keep

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manufacturing tool from abutting the ridge structure of the laser chip as taught by Miyazaki to Kai." Applicants respectfully traverse this contention as follows. Applicants do not see any such teaching or suggestion in Miyazaki and/or Cai II. For one thing, Cai II teaches away from such pads because bonding pads 304 in FIG. 3 of Cai II clearly do not protrude beyond an edge of the waveguide ridge 302. Further, Miyazaki does not even disclose the concept of an active area, much less that the pads reside only on non-active areas of the junction surface.

If the rejection of claims 3-4 and/or 23 is to be maintained, applicants respectfully request that the Examiner provide a reference or references that show all the limitations of claim 23, and if two or more references are to be combined, any teaching or suggestion for such combination rather than merely stating that "it would have been obvious to the one having ordinary skill in the art at the time the invention was made to provide a laser chip that has a plurality of pads on the non-active area that keep manufacturing tool from abutting the ridge structure of the laser chip." For one thing, Miyazaki and Cai II do not even disclose anything about use of such a manufacturing tool, and none of the other cited references also do not discuss using such a manufacturing tool. Applicants submit that the solution provided in the present application cannot possibly be obvious over the cited references, when the cited references do not address the manufacturing tool which creates vacuum (e.g., pick-and-place tool 106) nor the problem posed by the use of such a manufacturing tool.

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In view of this, applicants request that the rejection of claim 23 be withdrawn and that it be allowed.

V. Concluding Remarks

In view of the foregoing amendments and remarks, applicants request an early issuance of a patent with claims 1-23. If there are any remaining issues that can be addressed over the telephone, the Examiner is invited to call applicants' attorney at the number listed below.

Respectfully submitted,

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